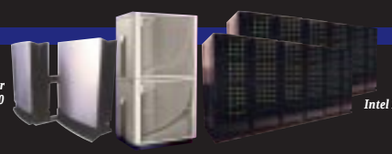
SPAWAR Systems Center San Diego

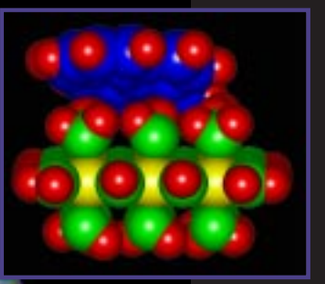
High Performance Computing and Networking
SSC San Diego Distributed Center



Computational Scientists Delivering Technological Advantage to the Warfighter

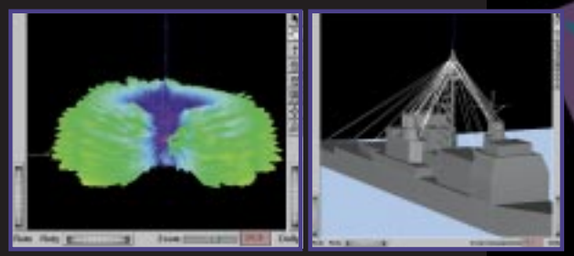
Bistatic Target Strength Prediction from Limited Data
A. K. Kevorkian (D714), D. Barach (D711)
and G. W. Benthien (D711)

Results and Significance: A new decomposition algorithm has been developed for sparse least squares problems of the type arising in bistatic target prediction models. The parallel speedups gained from the new method (nine- to fifteen-fold) will enable the extension of the frequency range to regions of greater interest to the Navy.



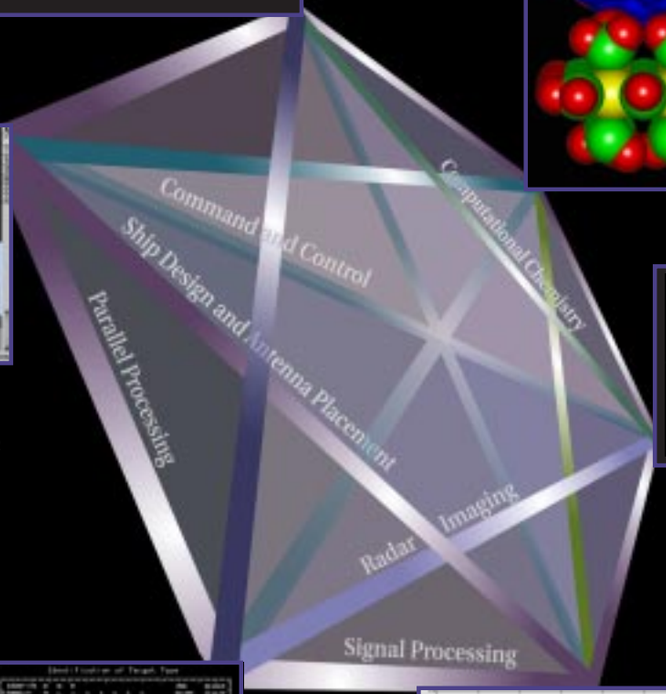
Modeling Contaminant Chemistry in the Environment
J. D. Kubicki (D361) and S. E. Apitz (D361)

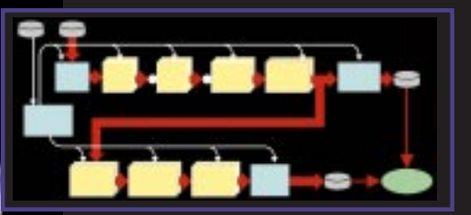
Results and Significance: Computer modeling of the chemical interactions between organic contaminants and sediments leads to increased understanding of the risk and fate associated with petroleum products released near naval shipyards. Knowledge gained from such studies may result in significant cost savings in the management of contaminant sediments.



Parallelization of NEC-BSC for Antenna Performance Prediction for Improved C4I
C. W. Manry Jr., J. Strauch, J. H. Meloling, and A. M. Lu (all D851)

Results and Significance: A computation that took 13 hours on a single SGI Indigo-2 workstation now only takes 1 hour on the Intel Paragon at SSC San Diego's HPCMO Distributed Center. With this increase in efficiency of NEC-BSC code, antenna performance is significantly improved, thus allowing for increased range and overall performance of C4I systems for the warfighter.



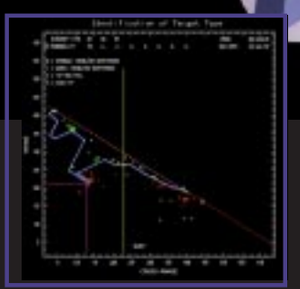


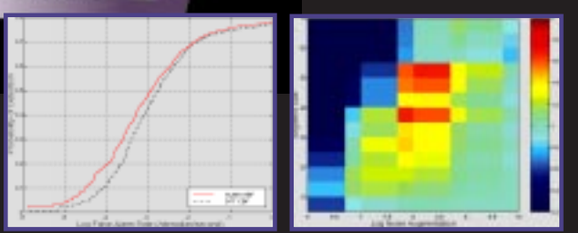
Scalable Prototyping of Embedded Signal Processing Systems
P. Partow (D712) and D. M. Cottel (D712)

Results and Significance: With availability on a wide range of platforms (e.g., Windows NT, IBM AIX, Silicon Graphics IRIX), SSC San Diego's Scalable Programming Environment (SPE) is proving to be the foundation on which parallel, scalable software modules can be provided to the signal and image processing community.

High-Speed Radar Imaging for Airborne Target Identification
C. V. Tran (D73A) and J. R. Evans (D73C)

Results and Significance: In this work, turnaround in processing time for one second of data was shortened from 60 minutes on a Sun SPARCstation 10 to between 5 and 6 minutes on the Convex Exemplar SPP-1600 at SSC San Diego's HPCMO Distributed Center. This reduction in turnaround has provided dramatic increase in productivity and resulted in improved air-threat identification algorithms and systems for the warfighter.





Active Sonar Adaptive Beamformer Performance
R. Hidinger (D712) and J. Lockwood (D7102)

Results and Significance: Robust statistical performance improvement over a large data set has been demonstrated for the active adaptive beamformer (ABF). Use of SSC San Diego's Scalable Programming Environment (SPE) has allowed throughputs twice as fast as real time for ABF and seven times faster than real time for the conventional beamformer.

SD 141 • April 1999 • Approved for public release; distribution is unlimited.